

map, and fastened by fish-glue. When rivers are boundaries, however, they are distinguished by gluing a line of sand over the marks on the map. Artificial boundaries are marked by narrow strips of paste-board. Towns are marked by round pieces of paste-board,—or, by square pieces if they are capitals. Numbers, as printed in relief for the Blind, are fastened upon prominent points and places on the map, and give reference to a table at the side, in which the corresponding names are given, also printed in relief.

A map of this kind, the basis of which is Tanner's large map of the United States, is hung up in one of the rooms of the Institute, and enables the members to judge how well it accomplishes the object in view. To its other merits, it adds that of cheapness, as this map was executed by a young woman in ten days.

Dr. Rhoads' plan is equally applicable to globes, and he has made one of the kind for the use of his pupils.

Some of the members of the Committee have had frequent opportunities of seeing Dr. Rhoads' maps and globe, used by the blind, and can give evidence that they answer perfectly the purpose of their construction.

The Committee, in view of the various merits of this plan, have great satisfaction in making a decided report in its favour, and respectfully recommend it to the Board of Managers, as worthy of the Scott Legacy Premium.

By order of the Committee.

WILLIAM HAMILTON, Actuary.

Philadelphia, May 14th, 1840.

#### *Report on a Coining Press at the United States Mint, Philadelphia.*

The Committee on Science and the Arts constituted by the Franklin Institute of the State of Pennsylvania, for the promotion of the Mechanic Arts, to whom was referred for examination, the Coining Press recently put in operation at the United States Mint, in this City, REPORT:—

That, an early opportunity was taken to visit the Mint and examine the machine in question; of which the following description and historical notice has been kindly furnished to the Committee, by F. Peale, Esq., Chief Coiner, under whose direction the new coining machinery has been constructed.

This press resembles in general form, but differs considerably in detail from, the first one put into operation in the Mint in 1836, of which a short notice was published in the *Journal of the Franklin Institute*, (Vol. XVIII. No. 307.) The changes which have been made in it are the result of some years' experience, and by the adoption of which its operation has been materially improved.

Four fluted Doric columns of heavy proportions, stand upon a low pedestal, and support a table of cast iron upon which is placed the arch for sustaining the pressure, and the plunger blocks and other supports for the working parts of the press. This table and arch were planed, and are finished with as high a degree of polish as the metal is capable of receiving. The shaft receives motion by means of a pulley and strap from the Steam Engine, and is furnished with a loose pulley for suspending its operation. A crank upon the shaft gives motion through a connecting piece to the lever, the forward end of which forms a part of the toggle joint, by the action of which the pressure is given to the planchets. Upon the shaft at the side of the table is the fly wheel, constructed with a *friction hub* with

tightening screws, an important provision to prevent the injury that would inevitably occur from the accidental presence of two pieces between the dies, at the same time. Upon the shaft is also placed an eccentric with a metallic strap, furnished with a regulating screw moving a lever by means of which the feeding carriage is brought forward; during its advance, it raises, by inclined planes, the *stake* or block containing the lower die, to the level of the collar in which the piece is struck, and which is sustained by a *platform* connected with the arch of the press, at the proper time to permit the piece which has received its impression to be pushed off by the *feeders* which are advancing with a fresh planchet, after depositing which, they return and take the lowest from a pile contained in a tube placed upon the platform. The opening and closing of the feeders upon the planchets, is accomplished by a friction slide working in guide grooves in the platform. The upper die is held by adjusting screws in a pivoted triangular guide, whose socket supports the ball of the lower part of the toggle joint; this triangular guide, lower joint and part of the lever, are supported by a jointed *bridle*, having the same motion as the toggle joint, and connected by pivots with the arch of the press. The eccentric and listers, last mentioned, are late improvements, which have materially added to the efficiency of this press, producing a smooth easy action, whilst the press is in operation at the rate of eighty-four revolutions per minute. The principal journals are oiled by syphon wicks in oil cups placed upon the caps of the boxes, in the classic form of small Etruscan vases.

The heavier parts of this press are of cast iron from the Foundry of Messrs. Merrick and Town, of this city, and are superior specimens of moulding and casting; the planing was also excellently executed in the establishment of these gentlemen. Many of the working parts, such as the lever and triangle, are of bronze, an alloy of copper and tin, in the proportions of nine of the former to one of the latter, being of a beautiful colour, working well, and retaining its lustre in an eminent degree, and for the above reasons deemed preferable to brass. The larger pieces were cast by the Messrs. Ames, at Cabotville, near Springfield, in Massachusetts, the smaller parts by Mr. Dyer of this city. The first named gentlemen, by their skill and care, have arrived at great perfection in this difficult art. Mr. Dyer also, by his perseverance, aided by free communication with the Messrs. Ames, has been very successful, and now furnishes castings of this alloy in every respect satisfactory.

All the small parts of the press are of steel, the heads of the screws and those parts exposed to friction, being hardened and tempered; the joints and fittings are executed with the greatest exactness and truth, and the whole has been finished to the highest possible degree.

We present the following note of the history of these presses.

In the "*Bulletin de la Société d'encouragement*, of June 1836, there appears a report by M. Francœur, on the coining press of M. Thonnelier of Paris, in which the merits of a press of similar principles, are warmly presented, and it is therein avowed that a press of the same character had been in successful operation at least eight years before in Munich, and that it is in the simplification and improvement of the German press, that M. Thonnelier has completely fulfilled the objects in view.

During a mission to Europe, for the Government, in 1834, for the purpose of investigating the various processes connected with Mint operations, Mr. Peale was present at a trial of the press of M. Thonnelier in Paris, and also saw the German presses in operation in Carlsruhe, in the Grand Duchy



of Baden. After his return, a press upon similar principles was constructed for the Mint of the United States, and has been ever since in operation. Neither the German press nor the French improvement was satisfactory to Mr. Peale, and the result of his views and experience has been the construction of the press under consideration, with all possible care and attention, in the workshop of the Mint, and which has completely satisfied every anticipation and desire.

The rate of operation is as follows, eighty-four revolutions per minute enables the press to strike five thousand pieces per hour, leaving a short interval for the removal of the boxes containing the coin, cleaning, oiling, &c. This rate has been maintained for ten hours, the usual duration of a day's work at the Mint, which gives 50,000 pieces, but it is by no means the maximum, for satisfactory experiments have shown that one hundred pieces might be struck per minute; but the above rate has been adopted as the most advantageous, and at the same time sufficiently expeditious. It is scarcely necessary to add, that the attendance of one person is all that is required for this press, and that attention, and not personal labour, is all that is necessary to supply planchets and maintain it in proper order.

The press had been in operation during some weeks, and in that time had coined many hundred thousand pieces without a single accident, or the slightest evidence of a want of perfect accuracy of performance. Beside this individual machine, to which the attention of the Committee was especially directed, and which merits the highest admiration for its judicious arrangement, excellence of workmanship, and great beauty of finish, the Committee examined several other presses and milling engines, which manifest good taste and mechanical skill, in a degree but little inferior to this last specimen. The steam engine also which drives the presses, and some other machinery, exhibits the beau ideal of motive power, and while it appears to possess all the essentials for efficient action, has sufficient symmetry and cleanliness for a piece of parlour furniture. An occasional visit to the Mint, and examination of its machinery, would, it is believed, be of much benefit to master mechanics, by improving their taste for the beautiful, and by shewing them how great room for improvement in workmanship and neat arrangement, exists in most manufacturing establishments. It may be added that the well known urbanity of the gentleman who has effected these excellent improvements, will insure an agreeable reception to all who may be inclined to avail themselves of this practical School of Arts.

By order of the Committee.

WILLIAM HAMILTON, Actuary.

Philadelphia, May 14th, 1840.

*Notice of the Conversation Meeting of the Franklin Institute, held at the Hall, April 23, 1840.*

The fifth Conversation Meeting of the season was held at the Hall of the Institute on the evening of Thursday, April 23rd. Among other objects of interest exhibited at this meeting, were a number of samples of castings from the foundry of Messrs. Savery & Co., which evince a great improvement in this important art; the flat and hollowware was almost as thin and as smooth as if made of sheet iron, and seemed perfectly sound and strong. A pair of cast fire irons from the same factory, had received a galvanizing coat of zinc and copper, by the process of Mr. T. Loring, to which

a polish had been given, equal in lustre, to burnished silver, said to be durable and cheap.

Mr. Thomas Loring, also exhibited several pieces of iron-tubing, covered with a protecting coating of the same alloy, upon which it is understood some experiments are now in progress, for the purpose of ascertaining its efficacy.

J. J. Mapes, Esq., of New York, editor of the *American Repertory*, shewed several specimens of Photographic portraits, executed by Mr. WILCOTT, of that city, which were much admired for strength of light.

Several beautiful portraits by the same process, executed by Mr. Robert Cornelius and Dr. Goddard, were exhibited by the latter gentleman. Mr. Joseph Saxton, produced a galvanic copy of a Photographic landscape, which, although manifestly imperfect, as the result of a first attempt, gives promise that these two novelties of science may be advantageously united. Professor Cresson gave a brief lecture on the continuance of vision, after the withdrawal of the visible object, which was illustrated by a modification of the Kaleidophone, on a large scale, and an instrument termed an ellipsarium, in which several luminous points are made to describe elliptical paths with sufficient speed to produce a permanent image of the whole path.

Much interest was excited by the exhibition of some specimens of the galvanic iris produced by the action of a galvanic current upon plates of polished steel, the specimens shewn were received by M. W. Baldwin, Esq. from Sir Michael Faraday. Mr. Baldwin gave an explanation of the process as witnessed by him at the Royal Institution, London.

The number of members and visitors present, was large, and the meeting one of considerable animation and interest.

SPECIFICATIONS OF ENGLISH PATENTS.

*Specification of a patent granted to WILLIAM GOSSAGE, of the county of Worcester, for his invention of certain improvements in manufacturing Iron.*—[Sealed 18th June, 1838.]

The method of converting pig, or crude, iron into malleable iron, by first melting the pig, or crude, iron in a furnace, called a "finery," and separating a considerable portion of the earthy impurities contained in such iron, and afterwards submitting the iron to the process called "puddling," and subsequently to the operation called "shingling," is well known.

It is also known to manufacturers of malleable iron, that during the operation called "shingling," as conducted in the above-mentioned method of converting pig, or crude, iron into malleable iron, a large quantity of black scoria, which is technically called "hammer slag," is separated from the metallic iron; and that this hammer slag consists of iron combined with oxygen, and is nearly free from earthy matter.

An improvement upon the above-mentioned method of converting pig or crude iron into malleable iron has been adopted, which improvement consists in using the hammer slag, obtained as before described, for the purpose of purifying pig or crude iron, and converting such iron into malleable iron by the operation called puddling, without the previous application of the finery process.

In working according to this improvement, hammer slag is put into the puddling furnace with pig or crude iron, in the first instance, and the oper-